**Supplementary Appendix 1 : Detailed methods**

**Intervention: Patient-education program HAUTTIEF**

The content of the educational program can be divided into four subgroups: Education on skin disease conditions, stress management, education sessions on lifestyle factors and feedback sessions.

*Education on skin disease conditions*

Previous studies have shown that school interventions providing information about skin disease can have beneficial effects1,2. Hence, we offered sessions that provide information about skin disease. In the first 2-hour session, a dermatologist provided medical education about psoriasis and AD concerning definitions, etiology, pathophysiology, clinical symptoms, trigger factors, aspects of allergy, itch-scratch-cycle, treatment options and prognosis. In addition, several skin care sessions were offered. In three 1-hour sessions, a pharmacologist together with a dermatologic nurse specialized in skin care explained different factors that can affect the skin and skin disease. Furthermore, participants learned how to take care of their skin and hair, whereby a wide range of skin care products were illustrated.

*Stress management*

*Yoga*

Studies reveal that a large proportion of patients with psoriasis or atopic dermatitis suffer from stress caused by the skin disease. Stress has not only a major role in triggering flares but also has a considerable impact on mental well-being and quality of life, because it is associated with the feeling of stigmatization, being an outcast, shame and low self-esteem3,4. As positive effects for yoga on symptoms of stress are described, we have implemented yoga in our training5. The first session started with a theoretical explanation about how and why these sessions are incorporated into the program. Yoga combines many stress-reducing techniques, including stretching, breathing exercises and meditation6. In the first run of the study, 8 h of yoga instruction were offered. However, as this amount was reported as excessive by patients, the number of hours was reduced to 4 for the second and third study run. At the same time, the sports lessons were increased from 4 h to 8 h.

*Physical training*

Exercise can help to reduce anxiety and stress-related symptoms7. Furthermore, patients with chronic skin diseases such as psoriasis or atopic dermatitis are prone to the development of systemic metabolic co-morbidities such as diabetes, obesity and cardiovascular disease8,9. As physical activity is an essential part of managing and preventing these co-morbidities, we included sports in our HautTief program10. The aim of sports lessons was to familiarize participants with a variety of sports, to encourage physical activity on a regular basis and to increase physical health. In total 8 h were offered.

*Mindfulness*

Mindfulness Meditation is a form of meditation with Buddhist roots based on paying attention to the present moment in a non-judgmental state. Elements such as attention control, emotion regulation and self-awareness may enhance self-regulation, stress reduction and increase well-being11. Because of these positive effects, the implementation of Meditation training into the educational program may be beneficial to our study population. Three 2-h sessions were offered.

*Progressive muscle relaxation (PMR)*

Jacobson's progressive muscle relaxation is a technique that is designed to induce feelings of deep relaxation of the body by tensing and relaxing certain muscle groups consciously while observing and discriminating the resulting physical sensations12. To reduce psychological distress and anxiety symptoms while improving well-being, we presented PMR as a stress-management method that was taught in four 1-h sessions13.

*Education sessions on lifestyle factors*

*Nutrition*

Atopic dermatitis and food allergies often coexist and may require dietary modifications if food allergens trigger severe clinical reactions14. A long-term diet and lifestyle modification form the first-line therapy in the management of the metabolic syndrome which affects many psoriasis patients 15. We included nutrition education in our training to raise the level of nutrition knowledge since managing skin diseases through dietary modifications is often challenging and misunderstood by patients. During two 2-h sessions, a dietician emphasized the principals of healthy and varied nutrition and a healthy lifestyle. Furthermore, questions about nutrition and skin were explained, for instance, the role of food supplements in skin diseases, the influence of metabolic syndrome on psoriasis, allergy and food.

*Sleep hygiene*

Sleep disorders are common in patients with chronic skin diseases and are among the major factors that lead to impaired quality of life, particularly in patients with AD. Sleep disorders include a wide spectrum ranging from frequent nighttime awakenings to specific sleep disorders such as obstructive sleep apnea16,17*.* Although sleep hygiene as a treatment for insomnia is regarded as ineffective, we implemented sleep hygiene into our educational program, as evidence for the efficacy of sleep hygiene education specifically for patients with chronic skin conditions remains unclear and further research is needed18. The significance of good sleep, the biological clock and sleep disorders were highlighted in this 1-h session about sleep hygiene, given by a psychologist specialized in sleeping disorders. The different treatment options to optimize sleep, with or without medication, were discussed.

*Smoking cessation (individual)*

Smoking is a major risk factor for the development of cardiovascular diseases and is associated with high mortality and morbidity19. Since the prevalence of smoking is high among patients with psoriasis or AD, we offered optional individually-delivered 1-h smoking cessation counseling shown to assist smokers to quit20-22.

*Substance abuse*

Among patients with psoriasis or AD, substance abuse such as excessive alcohol consumption is more prevalent than in the general population23,24. During this 1-h session, conducted by a psychologist, extensive information was given about drug abuse with a special focus on alcohol abuse, the short- and long-term effects and treatment options.

*Practical philosophy*

This 2-h session was a careful moment of group reflection: in a philosophical way, reflections are made about how participants think, feel and experience their life with a skin disease. Principles of ethical philosophy were introduced to aid in disease management and coping.

*Psychodermatology*

There is a high prevalence of psychiatric disorders in patients with psoriasis or AD, including depression, anxiety and suicidal thoughts25. This strong association of psychiatric disorders with skin diseases emphasizes the importance of psychological interventions and highlights the World Health Organization statement that there can be “no health without mental health”26. In this 1-h session, a psychologist informed about the effects of chronic dermatoses on the consequent emergence of psychopathological disorders such as anxiety and depression. Possible treatment options such as cognitive behavioral therapy were explained.

Feedback

Halfway through the program, the dermatologist saw the subjects on an individual basis to receive feedback and to answer individual questions. At the end of the program, feedback was given during a group evaluation session

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